

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) Optical device for focusing a laser beam, said device being adapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, the optical device comprising:

- a focusing lens upon which the laser beam is directed; and
- first means for selecting only a central portion of the laser beam;

wherein said first means is directly and integrally applied on the focusing lens and defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along said fixed reading direction,

wherein said first means comprises a diaphragm having a central aperture adapted to allow propagation of the central portion of the laser beam, and a surrounding surface adapted to obstruct the propagation of a surrounding portion of the beam, the lens and the diaphragm comprising opposed front surfaces, of conjugate shape, adapted to be reciprocally coupled.

2. (Original) Device according to claim 1, wherein the laser beam is a substantially elliptic and astigmatic beam.

3. (CANCELED)

4. (Previously Presented) Device according to claim 1, wherein said aperture has a Fresnel number smaller than 1.2 along said reading direction.

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

5. (Previously Presented) Device according to claim 1, wherein said aperture has a Fresnel number smaller than 2 along an orthogonal direction with respect to said reading direction.

6. (Previously Presented) Device according to claim 1, wherein said first means comprises a coating of a substantially opaque material, applied on a peripheral portion of a front surface of the focusing lens so as to allow the propagation of the central portion of the laser beam, and obstruct the propagation of a surrounding portion of beam.

7. (Previously Presented) Device according to claim 6, wherein said coating is applied on the front surface of the focusing lens faced on the opposed side with respect to a source of emission of said laser beam.

8. (Previously Presented) Device according to claim 6, wherein said coating is applied according to at least one of the following methods: spraying, sputtering, evaporation, printing, painting.

9. (CANCELED)

10. (Currently Amended) Device according to claim 91, further comprising an adhesive which is interposed between the diaphragm and the focusing lens.

11. (Original) Device according to claim 1, wherein the focusing lens and said first means constitute a single optical element comprising, in a central portion, the focusing lens and, in a surrounding portion, means adapted to separate the central portion of the beam from the surrounding portion of beam.

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

12. (Original) Device according to claim 11, wherein said focusing lens is a diffracting lens made by a diffracting technology.

13. (Original) Device according to claim 11, wherein said means adapted to separate the central portion of the beam from the surrounding portion of beam comprises a surface made of a substantially opaque material, which is adapted to obstruct the propagation of the surrounding portion of beam.

14. (Original) Device according to claim 11, wherein said means adapted to separate the central portion of beam from the surrounding portion of beam comprises a surface made of a diffusing material, adapted to disperse the surrounding portion of beam.

15. (Previously Presented) Device according to claim 14, wherein the surface of diffusing material is shaped according to one of the following lenses: divergent Fresnel lens, refractive lens, diffractive lens.

16. (Previously Presented) Device according to claim 1, comprising means for allowing the optical alignment between the focusing lens and a source of emission of said laser beam.

17. (Previously Presented) Optical device for focusing a laser beam, said device comprising:

- a focusing lens upon which the laser beam is directed;
- means for allowing the optical alignment between the focusing lens and a source of emission of said laser beam; and
- first means for selecting only a central portion of the laser beam;

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

wherein said first means is directly applied on the focusing lens and defines on the focusing lens an aperture;

wherein the means for allowing the optical alignment between the source of emission and the focusing lens comprises a substantially tubular portion of lens which extends from a front surface of the focusing lens and is adapted to be mounted by interference on a support structure of the source of emission, said substantially tubular portion comprising an inner wall provided with at least one tooth extended in a substantially radial direction and adapted to be housed into a corresponding housing obtained on the support structure of the source of emission.

18. (Original) Device according to claim 17, further comprising an adhesive interposed between the support structure of the source of emission and the substantially tubular portion of the focusing lens.

19. (Original) Device according to claim 18, wherein said adhesive is a thermally conductive glue.

20. (Previously Presented) Device according to claim 17, wherein the inner wall of the substantially tubular portion of the lens is coated with a substantially opaque material.

21. (Previously Presented) Optical device for focusing a laser beam, said device comprising:

- a focusing lens upon which the laser beam is directed;
  - means for allowing the optical alignment between the focusing lens and a source of emission of said laser beam; and
  - first means for selecting only a central portion of the laser beam;
- wherein said first means is directly applied on the focusing lens and defines on the focusing lens an aperture;

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

wherein the means for allowing the optical alignment between the source of emission and the focusing lens comprises at least two strips which extend from a front surface of the lens and are adapted to be mounted by interference on a support structure of the source of emission.

22. (Previously Presented) Device according to claim 16, wherein the means for allowing the optical alignment between the source of emission and focusing lens comprise a substantially tubular container adapted to house the focusing lens and the source of emission.

23. (Previously Presented) Optical device for focusing a laser beam, said device comprising:

- a focusing lens upon which the laser beam is directed;
- means for allowing the optical alignment between the focusing lens and a source of emission of said laser beam; and

- first means for selecting only a central portion of the laser beam;

wherein said first means is directly applied on the focusing lens and defines on the focusing lens an aperture;

wherein the means for allowing the optical alignment between the source of emission and the focusing lens comprise a substantially tubular container adapted to house the focusing lens and the source of emission; and

wherein the focusing lens comprises a reference notch intended for being positioned in alignment with a visual reference marked on the container.

24. (Previously Presented) Device according to claim 23, further comprising a clamping washer adapted to lock the focusing lens in position inside the container.

25. (Previously Presented) Optical device for focusing a laser beam, said device comprising:

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

- a focusing lens upon which the laser beam is directed;
- means for allowing the optical alignment between the focusing lens and a source of emission of said laser beam; and
  - first means for selecting only a central portion of the laser beam;
    - wherein said first means is directly applied on the focusing lens and defines on the focusing lens an aperture;
    - wherein the means for allowing the optical alignment between the source of emission and the focusing lens comprise a substantially tubular container adapted to house the focusing lens and the source of emission; and
    - wherein the container comprises an internal guide adapted to cooperate with an alignment slot formed on the focusing lens.

26. (Original) Device according to claim 1, further comprising means for reading an optical code.

27. (Previously Presented) Lens for focusing a laser beam adapted for use with a device for reading an optical code by means of said laser beam at least along one fixed reading direction, said lens including a coating means made of a substantially opaque material, applied on a peripheral portion of a front surface of the lens so as to allow the propagation of a central portion of the laser beam, and obstruct the propagation of a surrounding portion of beam, wherein said coating means defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along said fixed reading direction.

28. (Currently Amended) Optical element for focusing a laser beam and adapted for use with a device for reading an optical code by means of said laser beam at least along one fixed reading direction, said element comprising a focusing lens and a diaphragm having a central aperture adapted to allow the propagation of a central portion

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

of the laser beam, and a surrounding surface adapted to obstruct the propagation of a surrounding portion of beam, the lens and the diaphragm comprising opposed front surfaces, having conjugated shape, adapted to be reciprocally coupled, wherein said diaphragm defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along said fixed reading direction.

29. (Previously Presented) Optical element for focusing a laser beam, said element being adapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, wherein said element comprises, in a central portion, a focusing lens adapted to allow the propagation of a central portion of the laser beam and, in a surrounding portion, means adapted to separate the central portion of the beam from a surrounding portion of beam, wherein said means defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along said fixed reading direction and wherein said means is integral with said focusing lens thereby forming a single optical element.

30. (Currently Amended) Apparatus for assembling an optical device according to claim 22 for focusing a laser beam, said optical device being adapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, the optical device comprising:

- a focusing lens upon which the laser beam is directed; and
  - first means for selecting only a central portion of the laser beam;
- wherein said first means is directly and integrally applied on the focusing lens and defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along said fixed reading direction, said optical device further comprising means for allowing optical alignment between the focusing lens and a source of emission of said laser beam, wherein the means for allowing the optical alignment between the source of

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

emission and the focusing lens comprises a substantially tubular container adapted to house the focusing lens and the source of emission,

wherein said apparatus comprises a support frame for the container and substantially automatic displacement means acting on the source of emission to position the source of emission inside the container.

31. (Currently Amended) Method for assembling a-an optical device according to claim 22, comprising the following stepsadapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, the optical device comprising:

- a focusing lens upon which the laser beam is directed; and
- first means for selecting only a central portion of the laser beam;  
wherein said first means is directly and integrally applied on the focusing lens and defines on the focusing lens an aperture having a Fresnel number which is smaller than 2  
along said fixed reading direction, said optical device further comprising means for allowing optical alignment between the focusing lens and a source of emission of said laser beam, wherein the means for allowing the optical alignment between the source of emission and focusing lens comprise a substantially tubular container adapted to house the focusing lens and the source of emission, said method comprising the steps:
  - inserting the focusing lens inside the container using displacement means;
  - observing an image of a spot caught by a sensor located at a fixed distance from the container, as a laser diode is inserted in the container;
  - stopping displacement of the laser diode when the image of the spot observed presents predetermined dimensions and shape; and
  - fixing the laser diode into position.

OLIVA  
Serial No. 09/497,552

Atty.Dkt: 3572-15  
Art Unit: 2873

32. (Currently Amended) Optical device for focusing a laser beam, said device comprising a single optical element upon which the laser beam is directed, said single optical element comprising:

a focusing lens; and  
first means arranged ~~beyond around~~ an outer edge of the focusing lens, adapted to separate a central portion of the laser beam from a surrounding portion of the laser beam;  
wherein the entire portion of the laser beam collected by the focusing lens is focused.

33. (Previously Presented) Device according to claim 32, wherein said focusing lens is a diffracting lens made by a diffracting technology.

34. (Previously Presented) Device according to claim 32, wherein said first means are made of a substantially opaque material, which is adapted to obstruct the propagation of the surrounding portion of the beam.

35. (Previously Presented) Device according to claim 32, wherein said first means are made of a diffusing material, adapted to disperse the surrounding portion of the beam.

36. (Previously Presented) Device according to claim 32, wherein the device is adapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, and wherein the first means defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along the fixed reading direction.

37. (Previously Presented) Device according to claim 35, wherein said first means of diffusing material is selected among the following elements: divergent Fresnel lens, refractive lens, diffractive lens.

OLIVA  
Serial No. 09/497,552

Atty Dkt: 3572-15  
Art Unit: 2873

38. (Previously Presented) Optical device for focusing a laser beam, said device comprising a single optical element upon which the laser beam is directed, said single optical element comprising:

a focusing lens in a central portion of the optical element; and  
first means in a surrounding portion of the optical element and around an outer edge of the focusing lens, adapted to separate a central portion of the laser beam from a surrounding portion of the laser beam, said first means and said focusing lens being distinct from one another and being arranged in said single optical element such that they are never adjacent along any direction of propagation of the laser beam within the single optical element;

wherein the entire portion of the laser beam collected by the focusing lens is focused.

39. (Previously Presented) Optical device for focusing a laser beam, said device comprising a single optical element upon which the laser beam is directed, said single optical element comprising:

a focusing lens in a central portion of the optical element; and  
first means in a surrounding portion of the optical element and around an outer edge of the focusing lens, adapted to separate a central portion of the laser beam from a surrounding portion of the laser beam;

wherein the entire central portion of the laser beam collected by the focusing lens is focused; and

wherein the device is adapted to be used with a device for reading an optical code by means of said laser beam along at least one fixed reading direction, and wherein the first means defines on the focusing lens an aperture having a Fresnel number which is smaller than 2 along the fixed reading direction.

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